UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
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Ref: 8EPR-ER

ACTION MEMORANDUM

SUBJECT: Request for Approval and Funding and for Waivers of the Statutory 12-Month Deadline and $2 Million Ceiling for a Classic Emergency Removal at the:

California Gulch NPL Site – Leadville Mine Drainage Tunnel
Leadville, Lake County, Colorado
39° 16' 25"N / 106° 17' 17"W

FROM: Hays Griswold, On-Scene Coordinator
8EPR-ER

THROUGH: Curtis Kimbel, Supervisor
Emergency Response Unit
8EPR-ER

TO: David A. Ostrander, Program Director
Preparedness, Assessment & Emergency Response

ABSTRACT

Site #:	0829 (LMDT)	Response Authority:	CERCLA
NPL Status:	Listed	Incident Category:	Classic Emergency
CERCLIS ID #:	COD980717938	RCRIS ID#:	
Response Type:	Fund-lead	Start Date:	02/19/2008
D.O. #:	017	Mobilization Date:	02/22/2008

I. Purpose

This action memorandum (AM) discusses an existing human health and environmental threat at the Leadville Mine Drainage Tunnel (LMDT) near Leadville, Lake County, Colorado, and requests funding for a CERCLA Removal to mitigate that threat. Also requested herein is waiver of the CERCLA 12-month Removal duration and $2 million ceiling statutory criteria.

II. LMDT Conditions and Background

A. LMDT Description

The information provided in this Action Memorandum is presented in a very succinct form because there is considerable detailed information in many other documents that have been produced over the duration of the overall California Gulch NPL Site and all of its Operable Units and specifically Operable Unit 06, within which the LMDT is located. For background and detailed NPL Site and LMDT information this Action Memorandum defers to and incorporates by reference the attached supporting documents (most pertinent to the Removal Action – The Leadville Mine Drainage Tunnel (LMDT) Containment System – Design Manual and plan, March 2005 (Attachment 1) and the Site Activities Report – Leadville Mine Drainage Tunnel, July, 14, 2005 (Attachment 2). For more background see Attachment 3; Ground Water Hydrology in The Vicinity of The Leadville Mine Drainage Tunnel Operable Unit 6 and Affected Areas Volume I, August, 2002 and Hydrogeologic Characterization of Ground Waters, Mine Pools and the Leadville Mine Drainage Tunnel, Leadville, Colorado (Attachment 3).

Physical location:

The LMDT is located in west central Colorado, just north of the town of Leadville. Beginning in the early 1940s, the US Bureau of Mines constructed the tunnel to provide centralized drainage for some of the interconnected mines east of town in the Leadville Mining District. The Bureau of Mines contracted LMDT construction during the periods 1943-1945 and 1950-1952. When completed, the LMDT extended for 11,299 feet from the portal near the present-day Village at East Fork subdivision. Ownership of the tunnel transferred to the US Bureau of Reclamation (BOR) in December, 1959. Subsequently, BOR constructed a water treatment plant near the LMDT portal to treat the tunnel effluent before its discharge into the nearby Arkansas River.

Since 1959, several tunnel collapses have been documented. Additionally, non-seasonal fluctuations in the LMDT discharge volume, and documented differences in water elevations at various points along the tunnel alignment and the Robert Emit Shaft indicate that other LMDT collapses have occurred.

1. LMDT characteristics

Initially, the LMDT drained at the rate of approximately 2000 gallons per minute (gpm). Currently, the LMDT drains at an estimated rate of 900-1100 gpm. The entire stream is directed to the BOR's water treatment plant (WTP) where the effluent, containing elevated levels of iron, manganese, zinc, and lead, is treated before discharging to the adjacent Arkansas River.

2. Release or threatened release into the environment of a hazardous substance or pollutant or contaminant

Blockages inside the LMDT are physically unstable. Given Region 8's experience of working with old mine drainage tunnels, it is extremely likely that, at some future time, the blockage(s) will fail, resulting in an uncontrolled, potentially catastrophic release of acidic mine water, rock, and sediment through the portal, bypassing the WTP, through the subdivision, and into the adjacent Arkansas River headwaters floodplain. Based on the threat of an uncontrolled release, EPA initiated an emergency response action on February 19th, 2008.

3. NPL status

This NPL Site was listed on the NPL in 1983. Since that time, numerous Site Investigations, Removal, and Remedial actions have been conducted at various locations at the site.

4. Maps, pictures, and other graphic representations

Numerous maps, pictures, tables, graphs, cross sections, and other graphic representations can be found in the attachments. Attachments 1 and 2 provide the most detailed and site-specific graphic information.

B. Other Actions to Date

1. Previous actions

As previously mentioned, there have been numerous activities and removal actions at this NPL Site (see EPA Administrative Record Files for this NPL Site), however, until the current classic emergency response began, there were no previous removal actions specific to this portion of the NPL site or the situation addressed by this Removal Action. There have been prior investigations and plans developed for Operable Unit 06 that address the emergency situation. Parts of the Leadville Mine Drainage Containment System – Design Manual and plan (Attachment 1) will be utilized as the Removal Action Plan: specifically two parts, installation of a pump at the GAW shaft and pumping to lower ground water levels and reduce or eliminate seep flows in California Gulch and drilling a well into the tunnel near the 46+66 well location, installing a well and pumping from directly behind the suspected location of a tunnel blockage.

2. Current actions

The classic emergency response action currently in progress is the only action addressing the situation at the LMDT. To date that action has resulted in installing a pump in the GAW shaft and pumping water to California Gulch.

C. State and Local Authorities' Role

State and local authorities are very involved and are cooperating.

1. State and local actions to date

The Lake County Commissioners issued a Declaration of Emergency citing the conditions that they believed were leading to a potentially catastrophic release from the LMDT. They have been cooperating and assisting on the response actions thus far.

2. Potential for continued State/local response

The situation is beyond the resources of State and local authorities; however, they are involved at every level and helping where possible.

III. Threats to Public Health or Welfare or the Environment

During an uncontrolled, sudden release of a large volume of water through the LMDT portal, the Village at East Fork subdivision, immediately adjacent to the portal, would possibly have little or no warning to prepare for a voluminous release. Such a release could endanger the lives of those people living in the subdivision. The entire river floodplain immediately downstream of the portal could be severely impacted by the water-born sediments containing high concentrations of heavy metals. In addition, the sediment load from such an event would cause long-lasting degradation of the aquatic ecosystem for several miles downstream because it would destroy benthic and aquatic life.

IV. Endangerment Determination

Due to tunnel blockage(s), the LMDT is inaccessible beyond station 4+00 (400 feet in from the portal). Beyond station 4+00, the numerous collapses have resulted in an increase in hydraulic pressure behind the rockfall plug(s).

Due to continuing LMDT structural deterioration, the gradually-increasing hydrostatic head on water retained behind the collapses and the increasing annual volumes of ground water entering the tunnel behind the rockfall plugs, there exists a potential for catastrophic release of impounded water (a 'blowout') through the LMDT portal.

In addition, newly-discovered surface seeps in the California Gulch drainages indicate a rise in ground water and mine pool levels throughout the District. The existing WTP is incapable of capturing and/or treating effluent volumes anticipated during a blowout, therefore, a catastrophic blowout would bypass the WTP and flow directly into the river floodplain.

Private residential units have been established just below the LMDT portal at the edge of the Arkansas River floodplain. It is likely that some of the residential units would be directly

impacted by a catastrophic blowout through the LMDT portal.

V. Proposed Actions and Estimated Costs

A. Proposed Actions

The purpose of the proposed action is to relieve water pressure behind the blockage in the LMDT, which will reduce the probability of a catastrophic release and reduce the flow of the seeps. These actions are essentially the first two parts of the multiple actions described in the Leadville Mine Drainage Tunnel Containment System – Design Manual and plan (for details see Attachment 1).

1. Proposed action description

<u>Pump the GAW Shaft</u>

The first proposed action, which is already underway, is to pump water from the GAW shaft. A 16-inch diameter steel cased well was installed in the Gaw shaft in the summer of 2005. The shaft is indirectly (via fracture flow not mine workings) hydraulically connected to the LMDT. Pumping from the shaft may provide some relief of the hydraulic pressure on the tunnel blockages. The pumping rate is expected to be in the range of 300 to 800 gpm, and, the water will be discharged to California Gulch. Current information indicates the water meets appropriate water quality standards.

<u>Verify Water Quality</u>

There will be a continual verification of water quality of the water pumped from the GAW shaft/well.

<u>Install New Extraction Wells In the LMDT</u>

A new extraction well will be installed at the 46+66 location along the LMDT from the surface directly into the LMDT. This location is a short distance up-gradient from what is believed to be the main blockage in the tunnel. A variable speed pump will be installed to pump water directly from inside the tunnel behind the blockage relieving the water pressure on the blockage.

Install New Piping to BOR WTP

A 12 inch HDPE fused welded pipe will be installed from the new extraction well to WTP in order to treat the pumped water. The BOR plant operator will be able to control pumping rates and water flow from the LMDT wells to optimize treatment and ensure the WTP can effectively treat water from the LMDT.

2. Contribution to remedial performance

The removal activities proposed in this action memorandum are consistent with the remedy chosen in the Operable Unit 06 Record of Decision.

3. Description of alternative technologies

All activities are typical construction/dewatering operations requiring no consideration of alternative technologies.

4. EE/CA

An EE/CA is not required for a Classic Emergency Removal Action.

5. ARARs

This is a Classic Emergency Response all ARAR's will be considered and applied to the extent practicable considering the exigencies of the situation.

6. Project schedule

The emergency response activities began February 19th. Pumping at the GAW shaft with a temporary pump began February 27th. A permanent pump was installed in the GAW shaft and began pumping March 6th.

From February 19th it took about three weeks to procure and install the permanent pump (extremely quick response considering there the lead time to order and build this kind of pump is normally two months).

From the initiation of response activities, the drilling of the hole into the tunnel is expected to take about nine weeks. Installation of the pump, installing the pipeline and hooking into the pipeline to the WTP, and begin actual pumping will take another four weeks.

B. Estimated Costs

Extramural Costs:

Emergency Response Cleanup (ERRS)	$ 600,000
Total START/ERT (including multiplier)	$ 500,000
Total IAG	$ 0
Subtotal, Extramural Costs	$1,100,000
Contingency (20%)	$ 220,000
TOTAL, REMOVAL PROJECT CEILING	**$1,320,000**

VI. Expected Change in the Situation if Action Delayed or Not Taken

If no action is taken, the possibility of an uncontrolled release of contaminated water from the mine tunnel would remain a real possibility and it is expected that the water level in the mine pool will continue to rise, which will increase pressure on the collapses and blockages in the LMDT.

VII. Outstanding Policy Issues

There are no outstanding policy issues.

VIII. Enforcement

A separate addendum will provide a confidential summary of current and potential future enforcement actions.

The total EPA costs for this removal action based on full-cost accounting practices that will be eligible for cost recovery are estimated at:

Total Removal Ceiling	$1,320,000
EPA's Direct Intramural Costs	$ 115,000
Subtotal	$1,435,000
Regional Indirect Cost (35%)*	$ 502,000
Estimated Total EPA Cost	$1,937,000

* Direct Costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs, consistent with the full cost accounting methodology effective October 2, 2000. These estimates do not include pre-judgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of the removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of total cost estimates nor deviation of actual costs from this estimate will affect the United States' right to cost recovery.

IX. Recommendation

This action memorandum represents the selected Removal Action for the LMDT, Lake County, Colorado, developed in accordance with CERCLA, as amended, and not inconsistent with the NCP. This decision is based on the administrative record for the LMDT and for Operable Unit 06 of the NPL Site.

Conditions at the LMDT meet the NCP Section 300.415(b) (2) criteria for a Removal, and I recommend your approval of the proposed removal action. The total project ceiling if approved will be $1,937,000. Of this, an estimated **$1,320,000** comes from the Regional removal allowance.

In accordance with the NCP Section 300.415(b)(5)(i and ii):

> "(i) There is an immediate threat to public health or welfare of the United States or the environment; continued response actions are immediately required to prevent, limit, or mitigate an emergency; and such assistance will not otherwise be provided on a timely basis; or
> (ii) Continued response action is otherwise appropriate and consistent with the remedial action to be taken,"

I hereby request waiver of the statutory $2 million cap and the 12-month duration criteria for removal actions. As related above, the current cost estimate for this action exceeds the funding cap. In addition, the actions described in this document will be conducted at elevations above 10,000 feet during winter conditions. Accordingly, the construction season at the LMDT is extremely limited, precluding Removal completion in the first construction season.

Approve: _____ Date: 3/12/08
David A. Ostrander
Director
Preparedness, Assessment, and
Emergency Response

Disapprove: _____ Date: _____
David A. Ostrander
Director
Preparedness, Assessment, and
Emergency Response

Enforcement Addendum

Attachments

Attachment 1 : Leadville Mine Drainage Tunnel (LMST) Containment System – Design Manual, March, 2005

Attachment 2: Site Activities Report – Leadville Drainage Tunnel July 14, 2005

Attachment 3: Ground Water Hydrology in The Vicinity of The Leadville Mine Drainage Tunnel, Operable Unit 6 and Affected Areas –

Volume I.

SUPPLEMENTAL DOCUMENTS

Support/reference documents that may be helpful to the reader and/or have been cited in the report may be found in the Administrative Record File at the Superfund Records Center for Region VIII EPA, 1595 Wynkoop, Denver, Colorado 80202.